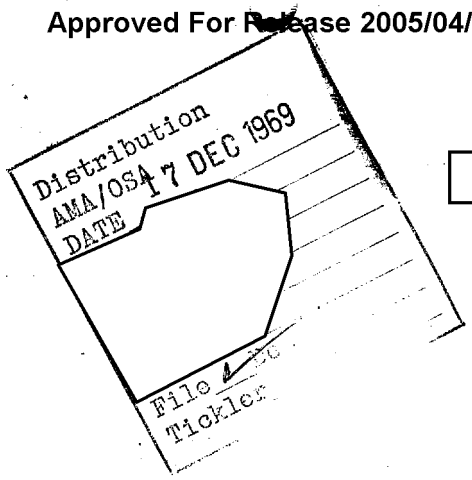

25X1

SECRET

25X1

IDEA-1051-69
Copy 3 of 6

16 December 1969

MEMORANDUM FOR: Deputy for Operations, OSA

SUBJECT : ECP-U-2R-45 on Ejection Seat Headrest Height

REFERENCES : A. Memo for AMS dated3Nov 69; Idea-0857-69

B. Memo for D/O/OSA dated 20 Oct 69; Idea-0914-69

C. Letter addressed to [redacted] from [redacted] dated 17 Nov 69 25X1 25X1

1. Request your concurrence to proceed with ECP-U-2R-45.

2. In response to Ref. A, LAC has answered the questions proposed in paragraph 1.a. The existing system is safe as is, with the exception of one mission pilot whose body build falls above the 95 percentile. With respect to the walk-around cushion and the additional two inches height with it, the proposed-seat adapters will allow for this modification and headrest clearance in all but the one pilot as mentioned above. It should be noted that the proposed modification not only includes a sleeping bag but also a tree-lowering device, an item of survival equipment already well proven in SEA.

3. Discussions with [redacted] Ref. A, paragraph 2, indicate that Customer No. 2 is not concerned with a sleeping bag, however, a tree-lowering device is considered essential. Additionally, if Customer No. 2 pilots exceed the 95%, they, too, could be in jeopardy if egress through the canopy becomes necessary. 25X1

USAF review(s) completed.

[redacted]

SECRET

GROUP 1
Excluded from automatic downgrading and declassification

25X1

4. If Operations feel the subject ECP is too costly at this time or that the Life-Support Equipment discussed above is not essential, then the subject ECP should be disapproved. It should be pointed out by the Life Support Officer, however, that if such an ejection through the canopy becomes necessary, it very well may be fatal in the tall man. Also, as discussed earlier with [redacted] dry-cold protection is grossly lacking in the Full-Pressure Suit and to save a downed crewmember in temperatures approximating 0° F, recovery will have to be made in a matter of hours. 25X1

[redacted] 25X1

AMS/OSA

Attachments
Refs A, B & C

25X1 AMS/OSA [redacted]
Distribution:
1 - Addee W/Att
2 - C/Idea/O/OSA W/att
3 - AMS/OSA W/att
4 - " Chrono w/o att
5 - D/M/OSA w/o att
6 - RB/OSA w/o att

[redacted] 25X1

SECRET

IDEA 0857-69
Copy 1 of 4

3 NOV 1969

MEMORANDUM FOR: Aero Medical Staff

SUBJECT : ECP U-2R-45 on Ejection Seat Headrest Height

REFERENCE : Memo to D/O/OSA from AMS/OSA, subj as above, dated 20 Oct 69 (IDEA 0914-69)

1. On 24 October 1969, discussed the attached ECP and associated problems. Before such a test should be approved, answers to the following are required:

a. has queried on the validity of the tests for the present seat headrest height. Of concern is the fact that a dummy approximately 65 inches in height was used for the above acceptance tests. Average height of an American is about 69 inches. The shorter man obviously will have more head clearance in the event of ejection and that coupled with a certain compression to his body will assure that his head does not go through the canopy before the top of the seat. For taller men, the question arises on how safe the present set up is in actuality. What then about the additional two inches added when the walk around sleeping bag is included in the seat kit cushion. Answers to the above will then affect the feasibility of continuing with the attached ECP.

2. Also I would ask what are the results of your discussions with (as recommended in before commenting on spending of more monies in this area.

Deputy for Operations, OSA

Attachment
As Stated

IDEA/OSA (30 Oct 69)
Distribution:
1 - AMS/OSA
2 - IDEA/OSA
3 - D/O/OSA
4 - RB/OSA

GROUP 1
Excluded from automatic downgrading and declassification

SECRET

SECRET

25X1

IDEA-0914-69
Copy 4 of 5

20 October 1969

MEMORANDUM FOR: Deputy for Operations, OSA

SUBJECT : ECP-U-2R-45 on Ejection-Seat Headrest Height, dated 8 October 1969

1. Request you review and comment on attached ECP-U-2R-45 on Ejection-Seat Headrest Height. Also find message attached giving Customer No. Two's position with respect to walk-around sleeping bag. Apparently the SAC mission does not include
25X1 flights over cold terrain or [redacted] is unfamiliar with dry-cold survival problems.

2. Project pilots do not carry the sleeping bag at the present time because it will not pack in the survival kit with the life raft. The bag will pack in the seat-kit cushion; however, it elevates the pilot an additional two (2) inches, thus the requirement for ejection-seat test firings. Life Support feels that this sleeping bag is a necessary part of the total survival package for project pilots and would appreciate the feelings of Operations on the matter.

3. Please review the "Operation Cold Case" study, particularly page 8. The comparison of full-pressure suit protection in dry cold with that of the down-filled walk-around bag should serve to illustrate the need for such a garment.

GROUP 1
Excluded from automatic downgrading and declassification

25X1.

SECRET

25X1

4. At the suggestion of [redacted] the feasibility of installing the sleeping bag as a lumbar-pad arrangement has been pursued. Four (4) factors make this proposal undesirable:

(1) The parchute risers across the shoulders would have to be extended further out of the parachute pack.

(2) The back-to-knee distance would be extended considerably, making ejection clearance critical.

(3) The movement of the pilot forward to the extent that would be required in the packing of this bag would change the center of gravity for the ejection sequence.

(4) The possible back discomfort resulting from the soft support provided by the bag would compromise long missions.

25X1

[redacted]
AMS/OSA

Attachments
As stated above

[redacted]

25X1

OSA - 3348-69

25X1

17 November 1969

To:

From:

Reference: Dwg. TRQ 12 Sht. 1 & 2, enclosed

Subject: PILOT MEASUREMENTS/SEAT CANOPY BREAKER

Three men were tested and the following measurements resulted from the ram to the top of the helmet. First man -1 1/2 inches, second man +2 1/4 inches, and third man +4 3/4 inches, as shown on drawing TRQ 12, sheet 2 of 2.

Using 2 1/2 inches for catapult compression and submarining
25X1 (per at time of ejection, No. 1 man's helmet would be 4 inches below present ram and 3 7/16 inches below proposed ram with new cushion at time of ejection.

No. 2 man's helmet would be 1/4 inches below present ram and 1 3/16 inches with new cushion using proposed 1 1/2 inch adapter at time of ejection.

With the seat in down position, No. 3 man has 7/8 inch clearance on canopy as shown. Using 2 1/2 inches for catapult compression and submarining, 1 inch for helmet compression, plus 7/8 inch clearance as shown, we have 4 3/8 inches overall at time of ejection. Present ram is 5 5/8 inches from canopy. This makes 1 1/4 inch interference between heomet and canopy at time of ejection. This man would use the proposed 3-inch ram adapter but not the new cushion.

Ship was designed to HIAD Man 5% to 95% HIAD Flying Personnel.

	5%	95%	Differences
Stature	65.2	73.1	7.9
Sitting Height	33.8	38.0	4.2

Ref. 4.2 difference for HIAD per 6 1/4 shown on drawing.

25X1

Project Engineer
Advanced Development Projects

Field		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
REMARKS	"6" TO HELMET FROM HEADREST TO BREAKER BAR				O.D. CUSHION TOO SHORT FOR COMFORT.															
[W]EIGHT					148	195	170						157	155	191	175	139	165	170	170
TRUNK MEASUREMENT					36"	38 1/2"	34 1/2"	38 1/2"					37"		42"	37 1/2"	34"	35 1/2"	37 1/2"	38"
[SE]T DOWN DEVISE WITH VISOR DOWN + SUNSHADE DOWN HEAD HEIGHT ABOVE HEADREST	PRESSURIZED					3 1/2"+	+1"	+5 1/2"												
	UNPRESSURIZED				+1"	4 3/4"+	+1 1/4"	+5 7/8"				3 1/2"+	3 3/4"+	3 7/8"+	4 5/8"+	3"+	4 7/16"+	3 3/16"+	5 3/4"+	4"+
[ST]AL[L] AROUND SLEEPING BA[G] W/ VISOR DOWN + SUNSHADE DOWN HEAD HEIGHT ABOVE HEADREST	PRESSURIZED					3 1/2"+	+1 1/2"	+4 1/4"												
	UNPRESSURIZED				1 1/2"+	4 1/2"+	+1 3/4"	+5 3/4"				3 1/4"+	+5 1/4"	3 1/4"+	4 3/8"+	3 1/4"	4 3/8"+	3 7/16"+	5 1/2"+	3 3/4"+
LOCKHEED CUSHION [HE]AD HEIGHT ABOVE [H]EADREST WITH VISOR + SUNSHADE D[OWN]	PRESSURIZED					+1 3/4	-1/2	+3/4												
	UNPRESSURIZED	1/2	1	1/2	1/4	1/4	1/2	3/4	3/4	1/2		[illegible]+	[illegible]+	"+	[illegible]+	1"+	1 3/4"+	5/8"+	3/16"+	15/8"+
		6	4	8	5	0	7	8	9	2	24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]